

WHAT IS CLAIMED:

1. A hybrid lighting system comprising:
 - means for concentrating sunlight;
 - a light distributor tube comprising two ends, a longitudinal axis and means for redirecting light entering an end of said tube out of said tube away from said longitudinal axis; and
 - means for directing concentrated sunlight into said light distributor tube.
2. A hybrid lighting system according to claim 1 comprising:
 - a source of artificial light;
 - means for directing artificial light into said light distributor tube.
3. A hybrid lighting system according to claim 2 wherein said artificial light directing means comprises a parabolic reflector.
4. A hybrid lighting system according to claim 2 wherein said artificial light directing means comprises a substantially elliptical reflector.
5. A hybrid lighting system according to claim 2 wherein said artificial light directing means comprises a parabolic reflector and a substantially elliptical reflector positioned to share a common focal point.

6. A hybrid lighting system according to claim 1 wherein said sunlight concentrating means comprises a first parabolic reflector having a focal point and a second parabolic reflector having a focal point which is smaller than the focal point of said first parabolic reflector, and wherein said reflectors have a common focal point.

7. A hybrid lighting system according to claim 6 wherein said sunlight concentrating means comprises a third parabolic reflector facing the same direction as said first parabolic reflector.

8. A hybrid lighting system according to claim 7 wherein said third parabolic reflector is connected to the back of said second parabolic reflector.

9. A hybrid lighting system according to claim 6 wherein concentrated, substantially collimated sunlight passes through a central opening in said first parabolic reflector.

10. A hybrid lighting system according to claim 2 comprising means for blending beams of sunlight with artificial light.

11. A hybrid lighting system according to claim 10 wherein said blending means comprises a beam splitter.

12. A hybrid lighting system according to claim 11 wherein said beam splitter comprises at least one dichroic coating.

13. A hybrid lighting system according to claim 11 wherein said beam splitter comprises a surface with a first portion covered by a reflective coating and a second portion not covered by the same reflective coating.

14. A hybrid lighting system according to claim 1 wherein said sunlight concentrating means recollimates said sunlight.

15. A hybrid lighting system according to claim 1 comprising means for aiming said sunlight concentrating means toward the sun.

16. A hybrid lighting system according to claim 15 wherein said aiming means comprises at least two reflectors disposed in two relatively rotatable supports, wherein a first rotatable support is rotatable about a first axis and a second rotatable support is rotatable about a second axis which is perpendicular to said first axis.

17. A device for changing the size of a substantially collimated beam of light comprising:

a first generally parabolic reflector comprising a first focal length;

a second generally parabolic reflector comprising a second focal length which is different from said first focal length, wherein said first reflector and said second reflector are positioned to have a common focal point.

18. A device for changing the size of a substantially collimated beam of light according to claim 17 wherein said first reflector and said second reflector are positioned to have a common longitudinal axis.

19. A device for providing collimated artificial light comprising:
an elliptical reflector comprising a first focal point and a second focal point;
a parabolic reflector comprising a focal point;
a source of artificial light positioned at said first focal point of said elliptical reflector;
wherein said elliptical reflector and said parabolic reflector are positioned so that said second focal point of said elliptical reflector is common to said focal point of said parabolic reflector.

20. A device for collecting, concentrating and collimating sunlight comprising at least two reflectors disposed in two relatively rotatable supports, wherein a first rotatable support is rotatable about a first axis and a second rotatable support is rotatable about a second axis which is perpendicular to said first axis; and

a first parabolic reflector having a first focal point and a second parabolic reflector having a focal point which is smaller than the focal point of said first parabolic reflector, and wherein said reflectors have a common focal point.

21. A device for collecting, concentrating and collimating sunlight according to claim 20 wherein said sunlight concentrating means comprises a third parabolic reflector facing the same direction as said first parabolic reflector.

22. A device for collecting, concentrating and collimating sunlight according to claim 21 wherein said third parabolic reflector is connected to the back of said second parabolic reflector.

23. A device for collecting, concentrating and collimating sunlight according to claim 20 wherein concentrated, substantially collimated sunlight passes through a central opening in said first parabolic reflector.

24. A device for blending sunlight and artificial light comprising:
an inlet for sunlight entering from a first direction;
an inlet for artificial light entering from a second direction;
a beam splitter disposed at the intersection of said sunlight and said artificial light, wherein said beam splitter reflects a portion of at least one of said sunlight or artificial light and transmits a non-reflected portion.

25. A device for blending sunlight and artificial light according to claim 24 wherein said beam splitter reflects a portion of both of said sunlight and said artificial light.

26. A device for blending sunlight and artificial light according to claim 25 wherein said beam splitter transmits a non-reflected portion of both of said sunlight and said artificial light.

27. A device for blending sunlight and artificial light according to claim 24 wherein said beam splitter transmits a non-reflected portion of both of said sunlight and said artificial light.

28. A device for blending sunlight and artificial light according to claim 24 wherein said first direction is perpendicular to said second direction.

29. A device for blending sunlight and artificial light according to claim 28 wherein said beam splitter is positioned at a 45° angle to said first direction and said second direction.

30. A device for blending sunlight and artificial light according to claim 24 wherein said beam splitter is positioned at a 45° angle to said first direction and said second direction.

31. A device for blending sunlight and artificial light according to claim 24 comprising a source of sunlight collimated artificial light.

32. A device for blending sunlight and artificial light according to claim 31 comprising a sunlight concentrator and collimator.

33. A device for blending sunlight and artificial light according to claim 24 comprising a sunlight concentrator and collimator.

34. A device for substantially collimating artificial light comprising:
a first parabolic reflector comprising a focal point, an open end and a central axis;
a ring comprising a serrated, reflective interior surface positioned proximate the open end of said parabolic reflector; and
a second parabolic reflector positioned along said central axis.

35. A device for substantially collimating artificial light according to claim 34 comprising a source of artificial light comprising an arc.

36. A device for substantially collimating artificial light according to claim 35 wherein said arc is positioned at the focal point of said first parabolic reflector.

37. A device for substantially collimating artificial light comprising:

 a first parabolic reflector comprising a focal point, an open end and a central axis;

 a second parabolic reflector extending from a position proximate said open end of said first parabolic reflector toward said central axis;

 a third parabolic reflector positioned along said central axis, said second parabolic reflector having a common focal point with said third parabolic reflector.

38. A device for substantially collimating artificial light according to claim 37 comprising a source of artificial light comprising an arc.

39. A device for substantially collimating artificial light according to claim 38 wherein said arc is positioned at the focal point of said first parabolic reflector.

40. An illuminating device comprising:

 a source of light;

 a distributor tube comprising two ends and a distributor which gradually slopes over a length of said tube, from a first position in said tube to a lower position in said tube to intersect greater amounts of light entering an end of said tube; and

 a baffle between said light source and said light distributor to shield said distributor from the heat of said light source.

41. An illuminating device according to claim 40 wherein said light source comprises a source of artificial light.

42. A hybrid lighting system comprising:

means for collecting sunlight;

at least one source of artificial light;

at least one beam splitter; and

at least one light distributor tube comprising two ends and means for directing light entering an end of said tube out a side of said tube wherein said sunlight and said artificial light are directed into said at least one distributor tube.

43. A hybrid lighting system according to claim 1 comprising a plurality of beam splitters which reflect and transmit different percentage of sunlight.

44. A hybrid lighting system according to claim 43 comprising a plurality of beam splitters which reflect and transmit different percentage of artificial light.